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November 20, 2007

FACSIMILE TRANSMISSION COVER SHEET

To: Mrs. Magdalen Greenlief
Office of the Commissioner for Patents

Fax: (571) 273-0125
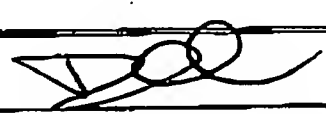
From: James A. Oliff

Your Ref.: 10/589,898   Our Ref.: 129122

Number of Pages Sent (Including cover sheet): 19

Prepared By: dxc

Comments:

Sent By:

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REQUEST FOR PARTICIPATION IN THE PATENT PROSECUTION HIGHWAY (PPH) PILOT PROGRAM BETWEEN THE JPO AND THE USPTO

Application No.:	10/589,898	First Named Inventor:	Yukihiro NAKASAKA
Filing Date:	August 18, 2006	Attorney Docket No.:	129122
Title of the Invention:	INTAKE AIR AMOUNT VARIATION DETECTOR		

THIS REQUEST FOR PARTICIPATION IN THE PPH PILOT PROGRAM MUST BE FAXED TO:
THE OFFICE OF THE COMMISSIONER FOR PATENTS AT 571-273-0125 DIRECTED TO THE ATTENTION OF MAGDALEN GREENLIEF

APPLICANT HEREBY REQUESTS PARTICIPATION IN THE PATENT PROSECUTION HIGHWAY (PPH) PILOT PROGRAM AND PETITIONS TO MAKE THE ABOVE-IDENTIFIED APPLICATION SPECIAL UNDER THE PPH PILOT PROGRAM.

The above-identified application validly claims priority under 35 U.S.C. 119(a) and 37 CFR 1.55 to one or more corresponding JPO application(s).

The JPO application number(s) is/are: 1) JP A 2005 -004169 2) JP A 2005-041240

The filing date of the JPO application(s) is/are: 1) January 11, 2005 2) February 17, 2005

    I.   **List of Required Documents:**

    a.   **A copy of all JPO office actions (<u>excluding</u> "Decision to Grant a Patent"*) in the above-identified JPO application(s).**

        ☒   Is attached. - *No Office Action excluding "Decision to Grant a Patent" was issued.*

        ☐   Is available via Dossier Access System. Applicant hereby requests that the USPTO obtain these documents via the Dossier Access System.

    *It is <u>not</u> necessary to submit a copy of the "Decision to Grant a Patent" and an English translation thereof.

    b.   **A copy of all claims which were determined to be patentable by the JPO in the above-identified JPO application(s).**

        ☒   Is attached.

        ☐   Is available via Dossier Access System. Applicant hereby requests that the USPTO obtain these documents via the Dossier Access System.

    c.   **English translations of the documents in a. and b. above along with a statement that the English translations are accurate are attached.**

Information disclosure statement listing the documents cited in the JPO office actions is attached.

Copies of all documents are attached except for U.S. patents or U.S. patent application publications.

[Page 1 of 2]

PTO/SB/20 (01-07)
Approved for use through 12/31/2008. OMB 0651-0058
U.S. Patent and Trademark Office; U.S. DEPARTMENT OF COMMERCE
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REQUEST FOR PARTICIPATION IN THE PATENT PROSECUTION HIGHWAY (PPH) PILOT PROGRAM BETWEEN THE JPO AND THE USPTO

Application No.:	10/589,898	First Named Inventor:	Yukihiro NAKASAKA

II. Claims Correspondence Table:
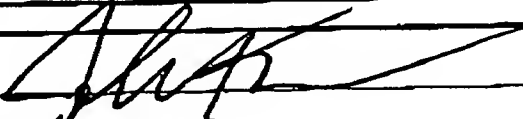
Claims in US Application	Patentable Claims In JP Application	Explanation regarding the correspondence
1-15	1-15	Claims 1-15 of the pending U.S. Application correspond to patentable claims 1-15 of the JP application, with the exception that the U.S. claims contain no multiple dependencies.
16	1	Claim 16 of the pending U.S. Application corresponds to patentable claim 1 of the JP application with the exception that claim 16 has been slightly amended to replace the recitation "means" with "unit".
17	5	Claim 17 of the pending U.S. Application corresponds to patentable claim 5 of the JP application with the exception that claim 16 has been slightly amended to replace the recitation "means" with "unit".
18	9	Claim 18 of the pending U.S. Application corresponds to patentable claim 9 of the JP application with the exception that claim 16 has been slightly amended to replace the recitation "means" with "unit".
19	3	Claim 19 of the pending U.S. Application corresponds to patentable claim 3 of the JP application with the exception that claim 16 has been slightly amended to replace the recitation "means" with "unit".

III. All the claims in the US application sufficiently correspond to the patentable/allowable claims in the JPO application.

IV. Payment of Fees:

The Commissioner is hereby authorized to charge the petition fee under 37 CFR 1.17(h) as required by 37 CFR 1.102(d) to ☒ Deposit Account No. 15-0461 .

☐ Credit Card. Credit Card Payment Form (PTO-2038) is attached.

Signature		Date: November 20, 2007
Name (Print/Typed) John S. Kern		Registration Number 42,719

Privacy Act Statement

The **Privacy Act of 1974** (P.L. 93-579) requires that you be given certain information in connection with your submission of the attached form related to a patent application or patent. Accordingly, pursuant to the requirements of the Act, please be advised that: (1) the general authority for the collection of this information is 35 U.S.C. 2(b)(2); (2) furnishing of the information solicited is voluntary; and (3) the principal purpose for which the information is used by the U.S. Patent and Trademark Office is to process and/or examine your submission related to a patent application or patent. If you do not furnish the requested information, the U.S. Patent and Trademark Office may not be able to process and/or examine your submission, which may result in termination of proceedings or abandonment of the application or expiration of the patent.

The information provided by you in this form will be subject to the following routine uses:

1. The information on this form will be treated confidentially to the extent allowed under the Freedom of Information Act (5 U.S.C. 552) and the Privacy Act (5 U.S.C 552a). Records from this system of records may be disclosed to the Department of Justice to determine whether disclosure of these records is required by the Freedom of Information Act.
2. A record from this system of records may be disclosed, as a routine use, in the course of presenting evidence to a court, magistrate, or administrative tribunal, including disclosures to opposing counsel in the course of settlement negotiations.
3. A record in this system of records may be disclosed, as a routine use, to a Member of Congress submitting a request involving an individual, to whom the record pertains, when the individual has requested assistance from the Member with respect to the subject matter of the record.
4. A record in this system of records may be disclosed, as a routine use, to a contractor of the Agency having need for the information in order to perform a contract. Recipients of information shall be required to comply with the requirements of the Privacy Act of 1974, as amended, pursuant to 5 U.S.C. 552a(m).
5. A record related to an International Application filed under the Patent Cooperation Treaty in this system of records may be disclosed, as a routine use, to the International Bureau of the World Intellectual Property Organization, pursuant to the Patent Cooperation Treaty.
6. A record in this system of records may be disclosed, as a routine use, to another federal agency for purposes of National Security review (35 U.S.C. 181) and for review pursuant to the Atomic Energy Act (42 U.S.C. 218(c)).
7. A record from this system of records may be disclosed, as a routine use, to the Administrator, General Services, or his/her designee, during an inspection of records conducted by GSA as part of that agency's responsibility to recommend improvements in records management practices and programs, under authority of 44 U.S.C. 2904 and 2906. Such disclosure shall be made in accordance with the GSA regulations governing inspection of records for this purpose, and any other relevant (i.e., GSA or Commerce) directive. Such disclosure shall not be used to make determinations about individuals.
8. A record from this system of records may be disclosed, as a routine use, to the public after either publication of the application pursuant to 35 U.S.C. 122(b) or issuance of a patent pursuant to 35 U.S.C. 151. Further, a record may be disclosed, subject to the limitations of 37 CFR 1.14, as a routine use, to the public if the record was filed in an application which became abandoned or in which the proceedings were terminated and which application is referenced by either a published application, an application open to public inspection or an issued patent.
9. A record from this system of records may be disclosed, as a routine use, to a Federal, State, or local law enforcement agency, if the USPTO becomes aware of a violation or potential violation of law or regulation.

STATEMENT

I,___Hidekazu Ohnishi___, a translator residing at ___6-2-6,NISHISHIZU, SAKURA-SHI,___ CHIBA___285-0845___JAPAN___ am the translator of the documents attached and I state that English translations of these documents are accurate.

Signature of Translator   _Hidekazu Ohnishi_

Dated   _11/12/2007_

English translation of the allowable claims in the corresponding JP application
G700500LP

CLAIMS

1. An intake air amount variation detector for detecting intake air amount variations among cylinders of a multiple-cylinder internal combustion engine, the device comprising:

injection amount control means for changing a fuel injection amount from an injection amount for stoichiometric operation to either an increased amount or a decreased amount;

computation means for determining the amount of a torque or rotation speed change that occurs when the fuel injection amount is changed by the injection amount control means; and

output means for outputting the torque or rotation speed change amount determined by the computation means as an index value that indicates the degree of intake air amount variations among the cylinders.

2. The intake air amount variation detector according to claim 1, further comprising:

comparison means for comparing a predetermined reference value with the amount of a change that occurs when the injection amount control means increases the fuel injection amount from the injection amount for stoichiometric operation; and

judgment means, which, when the amount of the change is greater than the reference value, judges that a permissible level is exceeded by the intake air amount variations among the cylinders.

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3. The intake air amount variation detector according to claim 1, further comprising:

comparison means for comparing a predetermined reference value with the amount of a change that

5   occurs when the injection amount control means decreases the fuel injection amount from the injection amount for stoichiometric operation; and

judgment means, which, when the amount of the change is smaller than the reference value, judges

10   that a permissible level is exceeded by the intake air amount variations among the cylinders.

4. The intake air amount variation detector according to any one of claims 1 to 3, wherein the

15   injection amount control means periodically increases or decreases the fuel injection amount from the injection amount for stoichiometric operation by a predetermined amount; and wherein the computation means extracts a change component having the same

20   frequency as a fuel injection amount change frequency from a torque or rotation speed change, and determines the amplitude of the extracted change component as the amount of the change.

25   5. An intake air amount variation detector for detecting the intake air amount variations among cylinders of a multiple-cylinder internal combustion engine, the device comprising:

injection amount control means for changing a

30   fuel injection amount for a particular one of the cylinders from an injection amount for stoichiometric operation to either an increased amount or a

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decreased amount;

computation means for determining the amount of
a torque or rotation speed change that occurs when
the fuel injection amount for the particular cylinder

5   is changed by the injection amount control means; and

output means for outputting the torque or
rotation speed change amount determined by the
computation means as an index value that indicates
the degree of intake air amount variation in the

10   particular cylinder.

6. The intake air amount variation detector
according to claim 5, further comprising:

comparison means for comparing a predetermined

15   reference value with the amount of a change that
occurs when the injection amount control means
increases the fuel injection amount for the
particular cylinder from the injection amount for
stoichiometric operation; and

20   judgment means, which, when the amount of the
change is greater than the reference value, judges
that a permissible level is exceeded by an undue
increase in the intake air amount in the particular
cylinder.

25

7. The intake air amount variation detector
according to claim 5, further comprising:

comparison means for comparing a predetermined
reference value with the amount of a change that

30   occurs when the injection amount control means
decreases the fuel injection amount for the
particular cylinder from the injection amount for

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stoichiometric operation; and

judgment means, which, when the amount of the
change is smaller than the reference value, judges
that a permissible level is exceeded by an undue
5 decrease in the intake air amount in the particular
cylinder.

8. The intake air amount variation detector
according to any one of claims 5 to 7, wherein the
10 injection amount control means periodically increases
or decreases the fuel injection amount for the
particular cylinder from the injection amount for
stoichiometric operation by a predetermined amount;
and wherein the computation means extracts a change
15 component having the same frequency as a fuel
injection amount change frequency for the particular
cylinder from a torque or rotation speed change, and
determines the amplitude of the extracted change
component as the amount of the change.

20
9. An intake air amount variation detector for
detecting the intake air amount variations among
cylinders of a multiple-cylinder internal combustion
engine, the device comprising:
25 injection amount control means for changing a
fuel injection amount from an injection amount for
stoichiometric operation to either an increased
amount or a decreased amount;
computation means for determining, on an
30 individual cylinder basis, the amount of a torque or
rotation speed change that occurs when the fuel
injection amount is changed by the injection amount

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control means; and

output means for outputting the torque or
rotation speed change amount determined by the
computation means as an index value that indicates
5   the degree of intake air amount variation in an
individual cylinder.

10. The intake air amount variation detector
according to claim 9, further comprising:
10   comparison means for comparing, on an
individual cylinder basis, a predetermined reference
value with the amount of the change that occurs when
the injection amount control means increases the fuel
injection amount from the injection amount for
15   stoichiometric operation; and
judgment means, which, when the amount of the
change is greater than the reference value, judges
that a permissible level is exceeded by an undue
increase in the intake air amount in an individual
20   cylinder.

11. The intake air amount variation detector
according to claim 9, further comprising:
comparison means for comparing, on an
25   individual cylinder basis, a predetermined reference
value with the amount of the change that occurs when
the injection amount control means decreases the fuel
injection amount from the injection amount for
stoichiometric operation; and
30   judgment means, which, when the amount of the
change is smaller than the reference value, judges
that a permissible level is exceeded by an undue

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decrease in the intake air amount in an individual cylinder.

12. The intake air amount variation detector according to any one of claims 9 to 11, wherein the injection amount control means periodically increases or decreases the fuel injection amount from the injection amount for stoichiometric operation by a predetermined amount; and wherein the computation means extracts a change component having the same frequency as a fuel injection amount change frequency from a torque or rotation speed change sampled on an individual cylinder basis, and determines the amplitude of the extracted change component as the amount of the change in an individual cylinder.

13. An intake air amount variation detector for detecting the intake air amount variations among cylinders of a multiple-cylinder internal combustion engine, the device comprising:
first injection amount control means for changing the fuel injection amount for a particular one of the cylinders from an injection amount for stoichiometric operation to an increased amount;
first computation means for determining the amount of a torque or rotation speed change that occurs when the fuel injection amount for the particular cylinder is changed by the first injection amount control means;
second injection amount control means, which, when the torque or rotation speed change amount determined by the first computation means is not

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greater than a predetermined reference value, decreases the fuel injection amount for the particular cylinder from the injection amount for stoichiometric operation;

5   second computation means for determining the amount of a torque or rotation speed change that occurs when the fuel injection amount for the particular cylinder is changed by the second injection amount control means; and

10   output means for outputting the torque or rotation speed change amount determined by the first computation means and the torque or rotation speed change amount determined by the second computation means as index values that indicate the degree of

15 intake air amount variation in the particular cylinder.

14. The intake air amount variation detector according to any one of claims 4, 8, and 12, wherein

20 the injection amount control means periodically changes the fuel injection amount at a frequency outside the range of human perception.

15. The intake air amount variation detector

25 according to any one of claims 1 to 14, further comprising:
       conversion means for converting the intake air amount variations among the cylinders to intake valve operating angle variations among the cylinders and/or

30 intake valve lift amount variations among the cylinders.

【書類名】　　　　　　　特許請求の範囲
　　【請求項1】
　　複数の気筒を有する内燃機関において気筒間の吸入空気量のばらつきを検出する装置であって、
　　燃料噴射量をストイキ運転時の噴射量から増大側或いは減少側の何れか一方に変化させる噴射量制御手段と、
　　前記噴射量制御手段により燃料噴射量を変化させたときのトルク或いは回転数の変化幅を求める演算手段と、
　　前記演算手段により求められたトルク或いは回転数の変化幅を、気筒間の吸入空気量のばらつきの程度を示す指標値として出力する出力手段と、
　　を備えることを特徴とする吸入空気量ばらつき検出装置。
　　【請求項2】
　　前記噴射量制御手段により燃料噴射量をストイキ運転時の噴射量から増大側に変化させたときの前記変化幅と所定の基準値とを比較する比較手段と、
　　前記変化幅が前記基準値を超えるときには、気筒間の吸入空気量のばらつきが許容レベルを超えていると判定する判定手段とを備えることを特徴とする請求項1記載の吸入空気量ばらつき検出装置。
　　【請求項3】
　　前記噴射量制御手段により燃料噴射量をストイキ運転時の噴射量から減少側に変化させたときの前記変化幅と所定の基準値とを比較する比較手段と、
　　前記変化幅が前記基準値を下回るときには、気筒間の吸入空気量のばらつきが許容レベルを超えていると判定する判定手段とを備えることを特徴とする請求項1記載の吸入空気量ばらつき検出装置。
　　【請求項4】
　　前記噴射量制御手段は、燃料噴射量をストイキ運転時の噴射量から所定量増大側に、或いは所定量減少側に周期的に変化させるように構成されており、
　　前記演算手段は、トルク或いは回転数の変化から燃料噴射量の変動周波数と同じ周波数の変動成分を抽出し、抽出した変動成分の振幅を前記変化幅として求めるように構成されていることを特徴とする請求項1乃至3の何れか1項に記載の吸入空気量ばらつき検出装置。
　　【請求項5】
　　複数の気筒を有する内燃機関において気筒間の吸入空気量のばらつきを検出する装置であって、
　　前記複数の気筒のうち特定気筒の燃料噴射量をストイキ運転時の噴射量から増大側或いは減少側の何れか一方に変化させる噴射量制御手段と、
　　前記噴射量制御手段により前記特定気筒の燃料噴射量を変化させたときのトルク或いは回転数の変化幅を求める演算手段と、
　　前記演算手段により求められたトルク或いは回転数の変化幅を、前記特定気筒における吸入空気量のずれの程度を示す指標値として出力する出力手段と、
　　を備えることを特徴とする吸入空気量ばらつき検出装置。
　　【請求項6】
　　前記噴射量制御手段により前記特定気筒の燃料噴射量をストイキ運転時の噴射量から増大側に変化させたときの前記変化幅と所定の基準値とを比較する比較手段と、
　　前記変化幅が前記基準値を超えるときには、前記特定気筒における吸入空気量の過剰側へのずれが許容レベルを超えていると判定する判定手段とを備えることを特徴とする請求項5記載の吸入空気量ばらつき検出装置。
　　【請求項7】
　　前記噴射量制御手段により前記特定気筒の燃料噴射量をストイキ運転時の噴射量から減少側に変化させたときの前記変化幅と所定の基準値とを比較する比較手段と、
　　前記変化幅が前記基準値を下回るときには、前記特定気筒における吸入空気量の不足側

へのずれが許容レベルを超えていると判定する判定手段とを備えることを特徴とする請求項5記載の吸入空気量ばらつき検出装置。

【請求項8】
　前記噴射量制御手段は、前記特定気筒の燃料噴射量をストイキ運転時の噴射量から所定量増大側に、或いは所定量減少側に周期的に変化させるように構成されており、
　前記演算手段は、トルク或いは回転数の変化から前記特定気筒の燃料噴射量の変動周波数と同じ周波数の変動成分を抽出し、抽出した変動成分の振幅を前記変化幅として求めるように構成されていることを特徴とする請求項5乃至7の何れか1項に記載の吸入空気量ばらつき検出装置。

【請求項9】
　複数の気筒を有する内燃機関において気筒間の吸入空気量のばらつきを検出する装置であって、
　燃料噴射量をストイキ運転時の噴射量から増大側或いは減少側の何れか一方に変化させる噴射量制御手段と、
　前記噴射量制御手段により燃料噴射量を変化させたときのトルク或いは回転数の変化幅を気筒毎に求める演算手段と、
　前記演算手段により求められた気筒毎のトルク或いは回転数の変化幅を、各気筒における吸入空気量のずれの程度を示す指標値として出力する出力手段と、
を備えることを特徴とする吸入空気量ばらつき検出装置。

【請求項10】
　前記噴射量制御手段により燃料噴射量をストイキ運転時の噴射量から増大側に変化させたときの前記変化幅と所定の基準値とを気筒毎に比較する比較手段と、
　前記変化幅が前記基準値を超えるときには、当該気筒における吸入空気量の過剰側へのずれが許容レベルを超えていると判定する判定手段とを備えることを特徴とする請求項9記載の吸入空気量ばらつき検出装置。

【請求項11】
　前記噴射量制御手段により燃料噴射量をストイキ運転時の噴射量から減少側に変化させたときの前記変化幅と所定の基準値とを気筒毎に比較する比較手段と、
　前記変化幅が前記基準値を下回るときには、当該気筒における吸入空気量の不足側へのずれが許容レベルを超えていると判定する判定手段とを備えることを特徴とする請求項9記載の吸入空気量ばらつき検出装置。

【請求項12】
　前記噴射量制御手段は、燃料噴射量をストイキ運転時の噴射量から所定量増大側に、或いは所定量減少側に周期的に変化させるように構成されており、
　前記演算手段は、気筒毎にサンプリングしたトルク或いは回転数の変化から燃料噴射量の変動周波数と同じ周波数の変動成分を抽出し、抽出した変動成分の振幅を各気筒における前記変化幅として求めるように構成されていることを特徴とする請求項9乃至11の何れか1項に記載の吸入空気量ばらつき検出装置。

【請求項13】
　複数の気筒を有する内燃機関において気筒間の吸入空気量のばらつきを検出する装置であって、
　前記複数の気筒のうち特定気筒の燃料噴射量をストイキ運転時の噴射量から増大側に変化させる第1の噴射量制御手段と、
　前記第1の噴射量制御手段により前記特定気筒の燃料噴射量を変化させたときのトルク或いは回転数の変化幅を求める第1の演算手段と、
　前記第1の演算手段により求められたトルク或いは回転数の変化幅が所定の基準値を超えていない場合には、前記特定気筒の燃料噴射量をストイキ運転時の噴射量から減少側に変化させる第2の噴射量制御手段と、
　前記第2の噴射量制御手段により前記特定気筒の燃料噴射量を変化させたときのトルク或いは回転数の変化幅を求める第2の演算手段と、

前記第1の演算手段により求められたトルク或いは回転数の変化幅、及び、前記第2の
演算手段により求められたトルク或いは回転数の変化幅を、前記特定気筒における吸入空
気量のずれの程度を示す指標値として出力する出力手段と、
を備えることを特徴とする吸入空気量ばらつき検出装置。
　　　【請求項14】
　　　前記噴射量制御手段は、人間が体感可能な周波数帯域外の周波数で燃料噴射量を周期的
に変化させることを特徴とする請求項4、8、12の何れか1項に記載の吸入空気量ばら
つき検出装置。
　　　【請求項15】
　　　気筒間の吸入空気量のばらつきを、気筒間の吸気バルブの作用角及び／又はリフト量の
ばらつきに換算する換算手段を備えることを特徴とする請求項1乃至14の何れか1項に
記載の吸入空気量ばらつき検出装置。

I. List of Required Documents

d. Information Disclosure Statement listing the documents cited in the JPO office actions.

- Since no Office Actions were issued, no documents are required to be submitted with an IDS

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Notes:

1. Untranslatable words are replaced with asterisks (****).

2. Texts in the figures are not translated and shown as it is.

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Dictionary: Last updated 11/16/2007 / Priority:

Decision to Grant a Patent

Application number: Application for patent 2005-041240

Date of Drafting: Heisei 19(2007) April 17

Patent examiner: NAKAMURA, Tatsuyuki 8503 3Z00

Title of invention: Inhalation air content variation sensing device

The number of claims: 15

Applicant: TOYOTA JIDOSHA KABUSHIKI KAISHA

Representative: TAKAHASHI, Hideki (and 3 others)

This application is to be granted a patent as there is no reason for refusal.

Director General(p.p.) Director(p.p.) Examiner Assistant examiner Manager for Determination of Classification NAKAGAWA, Ryuji NAKAMURA, Tatsuyuki NAKAGAWA, Ryuji 8509 8503 8509

1. Distinction of Patent: Usually

2. Reference documents: **

3. Application of Patent Law, Section 30: Nothing

4. Change of Title of Invention: Nothing

5. International Patent Classification (IPC)

F02D 45/00 362J, F02D 45/00 364B, F02D 13/02 D, F02D 41/04 330J

6. Deposition of Microorganism

7. Display of Purport that Retroactivity of Filing Date is not Accepted

Decision to Grant a Patent(Memorandum)

Application number: Application for patent 2005-041240

1. Technical Fields to Be Searched (IPC, DB Name)
F02D 45/00 F02D 13/02 F02D 41/04

2. Reference patent documents
JP,09-032710,A (JP, A) JP,2003-522878,A (JP, A) JP,2004-138036,A (WO, A1) (JP, A)
International-Publication the 2005/008052

3. Reference books and magazines

[Translation done.]